Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-88. (canceled).

89. (previously presented) A method of forming arrays of oligonucleotides on a solid support comprising:

providing a solid support having an array of positions each suitable for attachment of a capture oligonucleotide;

attaching linkers to the solid support surface, wherein the linkers are suitable for coupling capture oligonucleotides to the solid support, at each of the array positions; and

selecting nucleotide multimers, wherein a selected nucleotide multimer has a nucleotide sequence that differs from the nucleotide sequence of another selected nucleotide multimer by at least 2 nucleotides, wherein no two dimers forming a nucleotide multimer are complementary to each other and the multimers would not result in self-pairing or hairpin formation; and

assembling the nucleotide multimers as capture oligonucleotides, wherein the nucleotide multimers are selected so that each of the plurality of capture oligonucleotides, formed from a plurality of assembled nucleotide multimers and attached to the solid support at each array position, have greater than sixteen nucleotides and have nucleotide sequences selected to hybridize with complementary oligonucleotide target sequences under uniform hybridization conditions across the array of oligonucleotides with minimal cross-reactivity and so that each capture oligonucleotide of the array differs in sequence from other adjacent capture oligonucleotides, when aligned to each other by at least 25% of the nucleotides, wherein the nucleotide multimers are formed from multiple nucleotides linked together.

90. (previously presented) The method according to claim 89 further comprising:

forming an array of a plurality of capture oligonucleotides on the solid support by a series of cycles, wherein said forming comprises:

applying a nucleotide multimer along parallel rows of the solid support;

turning the support 90 degrees;

attaching a nucleotide multimer along parallel rows of the solid support to form oligonucleotides at row intersections having 2 sets of nucleotide multimers; and

repeating said applying, turning, and attaching until the oligonucleotides at the row intersections have 6 sets of nucleotide multimers.

91. (previously presented) The method according to claim 89, wherein the solid support is made from a material selected from the group consisting of plastic, ceramic, metal, resin, gel, glass, silicon, and composites thereof.

92. (previously presented) The method according to claim 89, wherein the solid support is in a form selected from the group consisting of slides, discs, membranes, films, and composites thereof.

93. (previously presented) The method according to claim 89, wherein the solid support has an array of positions with the capture oligonucleotides at different positions having different nucleotide sequences.

94. (previously presented) The method according to claim 93, wherein the solid support has wells, raised regions, or etched trenches.

95. (previously presented) The method according to claim 94, wherein the solid support is in the form of a microtiter plate.

96. (previously presented) The method according to claim 89, wherein said attaching a linker comprises:

silanizing a surface of the solid support.

97. (previously presented) The method according to claim 89, wherein the solid support is functionalized with olefin, amino, hydroxyl, silanol, aldehyde, keto, halo, acyl halide, or carboxyl groups.

98. (previously presented) The method according to claim 97, wherein the solid support is functionalized with an amino group by reaction with an amine compound selected from the group consisting of 3-aminopropyl triethoxysilane, 3-aminopropylmethyldiethoxysilane, 3-aminopropyl dimethylethoxysilane, 3-aminopropyl trimethoxysilane, N-(2-aminoethyl)-3-aminopropylmethyl dimethoxysilane, N-(2-aminoethyl-3-aminopropyl) trimethoxysilane, aminophenyl trimethoxysilane, 4-aminobutyldimethyl methoxysilane, 4-aminobutyl triethoxysilane, aminoethylaminomethylphenethyl trimethoxysilane, and mixtures thereof.

99. (previously presented) The method according to claim 97, wherein the solid support is functionalized with an olefin-containing silane.

100. (previously presented) The method according to claim 99, wherein the olefin-containing silane is selected from the group consisting of 3-(trimethoxysilyl)propyl methacrylate, *N*-[3-(trimethoxysilyl)propyl]-*N'*-(4-vinylbenzyl)ethylenediamine, triethoxyvinylsilane, triethylvinylsilane, vinyltrichlorosilane, vinyltrimethoxysilane, vinyltrimethylsilane, and mixtures thereof.

101. (previously presented) The method according to claim 99, wherein the silanized support is polymerized with an olefin containing monomer.

102. (previously presented) The method according to claim 101, wherein the olefin-containing monomer contains a functional group.

103. (previously presented) The method according to claim 102, wherein the olefin-containing monomer is selected from the group consisting of acrylic acid, methacrylic acid, vinylacetic acid, 4-vinylbenzoic acid, itaconic acid, allyl amine, allylethylamine, 4-aminostryrene, 2-aminoethyl methacrylate, acryloyl chloride, methacryloyl chloride, chlorostyrene, dichlorostyrene, 4-hydroxystyrene, hydroxymethylstyrene, vinylbenzyl alcohol, allyl alcohol, 2-hydroxyethyl methacrylate, poly(ethylene glycol) methacrylate, and mixtures thereof.

104. (previously presented) The method according to claim 101, wherein the support is polymerized with a monomer selected from the group consisting of acrylic acid, acrylamide, methacrylic acid, vinylacetic acid, 4-vinylbenzoic acid, itaconic acid, allyl amine, allylethylamine, 4-aminostyrene, 2-aminoethyl methacrylate, acryloyl chloride, methacryloyl

chloride, chlorostyrene, dischlorostyrene, 4-hydroxystyrene, hydroxymethyl styrene, vinylbenzyl alcohol, allyl alcohol, 2-hydroxyethyl methacrylate, poly(ethylene glycol) methacrylate, and mixtures thereof, together with a monomer selected from the group consisting of acrylic acid, methacrylic acid, vinylacetic acid, 4-vinylbenzoic acid, itaconic acid, allyl amine, allylethylamine, 4-aminostyrene, 2-aminoethyl methacrylate, acryloyl chloride, methacryloyl chloride, chlorostyrene, dichlorostyrene, 4-hydroxystyrene, hydroxymethyl styrene, vinylbenzyl alcohol, allyl alcohol, 2-hydroxyethyl methacrylate, poly(ethylene glycol) methacrylate, methyl acrylate, methyl methacrylate, ethyl acrylate, ethyl methacrylate, styrene, 1-vinylimidazole, 2-vinylpyridine, 4-vinylpyridine, divinylbenzene, ethylene glycol dimethacrylate, *N,N'*-methylenediacrylamide, *N,N'*-phenylenediacrylamide, 3,5-bis(acryloylamido) benzoic acid, pentaerythritol triacrylate, trimethylolpropane trimethacrylate, pentaerytrithol tetraacrylate, trimethylolpropane ethoxylate (14/3 EO/OH) triacrylate, trimethylolpropane ethoxylate (7/3 EO/OH) triacrylate, trimethylolpropane propoxylate (1 PO/OH) triacrylate, trimethylolpropane propoxylate (2 PO/OH) triacrylate, and mixtures thereof.

105. (previously presented) The method according to claim 99 further comprising:

forming an array of a plurality of capture oligonucleotides on the solid support by a series of cycles, wherein said forming comprises:

photolithographically masking the solid support;

photochemically deprotecting the linker or outermost nucleotides attached to the solid support at unmasked array positions; and

adding nucleotides with a photoactivatable protecting group at photochemically deprotected array positions.

106. (previously presented) The method according to claim 105, wherein the photoactivable protecting group is selected from the group consisting of nitroveratryloxycarbonyl, o-nitrobenzyloxycarbonyl, fluorenylmethoxycarbonyl, dimethyl-dimethoxybenzyloxycarbonyl, oxymethyleneanthraquinone, and mixtures thereof.

107. (previously presented) The method according to claim 105, wherein the protecting group protects the nucleotides at their 3' or 5' ends.

108. (previously presented) The method according to claim 105 further comprising:

washing the solid support after said photochemically deprotecting and said adding.

109. (previously presented) The method according to claim 89, wherein the solid support surface is non-hydrolyzable.

110. (previously presented) The method according to claim 89, wherein the solid support has an array of positions with the plurality of capture oligonucleotides having the same nucleotide sequences.

111. (canceled).

112. (previously presented) The method according to claim 93, wherein each capture oligonucleotide is separated from adjacent capture oligonucleotides by barrier oligonucleotides which are shorter than the capture oligonucleotides.

113-148. (canceled).

149. (previously presented) The method according to claim 89, wherein the nucleotide multimers are selected from the group consisting of nucleotide tetramers, pentamers, and hexamers.

150. (previously presented) The method according to claim 149, wherein the nucleotide multimers are nucleotide tetramers.

151. (previously presented) The method according to claim 150, wherein the nucleotide tetramers are non-palindromic and non-repetitive.

152. (currently amended) The method according to claim 150, wherein the nucleotide tetramers are ~~set forth in Table 1~~ selected from the group consisting of TCTG, TGTC, TCCC, TGCG, TCGT, TTGA, TGAT, TTAG, CTTG, CGTT, CTCA, CACG, CTGT, CAGC, CCAT, CGAA, GCTT, GGTA, GTCT, GACC, GAGT, GTGC, GCAA, GGAC, AGTG, AATC, ACCT, ATCG, ACGG, AGGA, ATAC, AAAG, CCTA, GATG, AGCC, and TACA.

153. (previously presented) The method according to claim 150, wherein the capture oligonucleotide probes have nucleotide sequences differing from each other by at least 6 nucleotides.